

57.¹² The teleconferencing system of claim 207¹, wherein the video image and spoken audio of a first participant at the first location, routed to said second location via said third location, can be reproduced at the workstations of both said first participant and a second participant at the second location.

58.² The teleconferencing system of claim 207¹, wherein said AV path includes dedicated links between said locations.

59.³ The teleconferencing system of claim 207¹, wherein said AV path includes dial-up connections between said locations.

60.⁴ The teleconferencing system of claim 207¹, wherein said AV path includes dial-up connections and dedicated links between said locations.

61.⁵ The teleconferencing system of claim 60⁴, wherein said AV path includes a dial-up connection between at least two locations and a dedicated link between at least two locations.

62.²⁰ The teleconferencing system of claim 57¹², further comprising a video mosaic generator configured to combine the captured video images of at least said first and second participants into a mosaic image for reproduction at at least one workstation.

63.²⁴ The teleconferencing system of claim 62²⁰, further comprising a distributed video mosaic generator configured to combine a portion of said mosaic image with a captured image of a third participant to generate a distributed mosaic image of the captured images of said three participants for reproduction at the workstation of at least one of the three participants.

²²
~~64~~ The teleconferencing system of claim ²⁰~~62~~, wherein the mosaic image includes images of the first and second and a third participant, the system further comprising an audio summer configured to receive the captured audio of said first, second and third participants and combining only the received audio of the second and third participants into an audio sum for reproduction at the workstation of said first participant.

²³
~~65~~ The teleconferencing system of claim ²²~~64~~, wherein the audio summer is configured to combine a part of the audio sum with the captured audio of another participant to generate a composite audio sum for reproduction at the workstation of at least one participant.

⁶
~~66~~ The teleconferencing system of claim ¹~~207~~, wherein the system is configured to optimize the routing of AV signals between said locations.

⁷
~~67~~ The teleconferencing system of claim ⁶~~66~~, wherein the signal routing is optimized based on either the actual or the anticipated state of said AV path.

⁸
~~71~~ The teleconferencing system of claim ¹~~207~~, wherein said AV path includes at least one trunk associated with at least one codec.

¹³
~~187~~ The teleconferencing system of claim ¹²~~57~~, further comprising:

- (a) a data network providing a data path for carrying data signals among the workstations; and
- (b) a data conference manager configured to managed a data conference during which shared data is displayed at the workstations of a plurality of participants.

¹⁵
~~188~~ The teleconferencing system of claim ¹³~~187~~, further comprising a video mosaic generator configured to combine at least a portion of captured video images of said first and second participants to generate a mosaic image for reproduction at least one workstation.

^{18 16} 189. The teleconferencing system of claim ^{15 17} 188, further comprising a close-up selector for selecting the image of one of the participants in said mosaic image and replacing said mosaic image with the image of said selected image.

^{17 19} 190. The teleconferencing system of claim ^{15 17} 188, wherein the mosaic image includes images of the first and second and a third participant, the system further comprising an audio summer configured to receive the captured audio of said first, second and third participants and combining only the received audio of the second and third participants into an audio sum for reproduction at the workstation of said first participant.

^{18 20} 191. The teleconferencing system of claim ^{19 17} 190, wherein the AV reproduction capabilities of at least the workstation of the first participant includes a plurality of speakers, the system further comprising:

(a) an audio control configured to control the reproduction of said audio sum at said first participant's workstation such that the composition of the audio originating from each of the second and third participants reproduced at each speaker is dependent on a position of the images of the second and third participant in said reproduced mosaic image.

^{19 21} 192. The teleconferencing system of claim ^{17 20} 190, further comprising an echo canceller to reduce echo during the reproduction of said audio sum.

^{14 16} 193. The teleconferencing system of claim ^{13 15} 187, wherein the AV and data paths define physically separate paths.

^{24 26} 195. The teleconferencing system of claim ^{22 24} 64, wherein the AV reproduction capabilities of at least the workstation of the first participant includes a plurality of speakers, the system further comprising:

SV
5/5/97

(a) an audio control configured to control the reproduction of said audio sum at said first participant's workstation such that the composition of the audio originating from each of the second and third participants reproduced at each speaker is dependent on a position of the images of the second and third participants in said reproduced mosaic image.

34 37
197. The method of conducting a teleconference of claim 218, further comprising the steps of:

- 28 30
- (a) combining the captured images of a first and second participant into a mosaic image; and
- (b) reproducing the mosaic image at a workstation.

35 37
198. The method of conducting a teleconference of claim 197, further comprising the steps of:

- 34 37
- (a) combining a portion of the mosaic image with a captured image of another of the participants to generate a composite mosaic image; and
- (b) reproducing the composite mosaic image at the workstation of at least one of the participants.

39 40
199. The method of conducting a teleconference of claim 218, further comprising the steps of:

- 28 30
- (a) receiving the captured audio of a first, second and third participant;
- (b) combining the received audio of only the second and third participants into an audio sum; and
- (c) reproducing the audio sum at the workstation of first participant.

29 30
200. The method of claim 218, further comprising the steps of:

(a) routing the compressed signals to optimize their transfer between the locations.

30 43 29 42 515/77
201. The method of claim 200, wherein the optimization is based on either the actual or the anticipated state of the links between the locations.

31 38 28 30
202. The method of conducting a teleconference of claim 218, further comprising the steps of:

- (a) managing a data conference during which data is shared among a plurality of participants and displayed at associated workstations; and
- (b) managing a videoconference, during which the video image and spoken audio of one participant are reproduced at the workstation associated with another participant.

32 37 31 32
203. The method of conducting a teleconference of claim 202, further comprising the steps of:

- (a) combining at least a portion of the captured images of a first and a second participant into a mosaic image; and
- (b) reproducing the mosaic image at a workstation.

33 34 32 33
204. The method of conducting a teleconference of claim 203 further comprising the steps of:

- (a) selecting the image of one of the participants in the mosaic image; and
- (b) replacing the mosaic image with the image of the selected image.

37 36 34 35
205. The method of conducting a teleconference of claim 197, further comprising the steps of:

- (a) receiving captured audio of the first and second participants and a third participant;
- (b) combining the received audio of only the second and third participants into an audio sum; and
- (c) reproducing the audio sum at the workstation associated with the first participant.

³⁷
206. ²⁸ The method of conducting a teleconference of claim ^{36 37} 205, wherein the reproduced mosaic image includes images of the first, second and third participants, the method further comprising the step of:

(a) reproducing the audio sum at the first participant's workstation such that the composition of the reproduced audio is dependent on a position of the images of participants in the reproduced mosaic image.

¹
207. A teleconferencing system for conducting a teleconference among a plurality of participants comprising:

- (a) first, second and third locations;
- (b) at least one workstation at each of the first, second and third locations, each workstation including audio and video capture and reproduction capabilities arranged to capture and reproduce participant video images and spoken audio;
- (c) a codec associated with each of the first, second and third locations;
- (d) an AV path linking the three locations;
- (e) a network switch associated with at least one of the first and second locations and designed to route codec compressed AV signals representing captured participant video images and spoken audio along the AV path;
- (f) a switch in communication with the third location to route compressed AV signals, destined for the second location, from the first location to the second location without the compressed AV signals being decompressed or reproduced at said third location; and
- (g) a Local Area Network switch functionally positioned between the workstation at and the codec associated with one of the first and second locations to route signals to the workstation at that location,

wherein the location at which the Local Area Network switch is positioned is a multi-participant location having a plurality of workstations, and

wherein the Local Area Network switch is arranged to receive signals from the codec at that location and route the received signals to a destination workstation of the workstation plurality.

Delete claims 208 and 209.

- ⁹
210. The teleconferencing system of claim ¹207, wherein
- (a) the number of workstations at each multi-participant location is greater than the number of any one resource in the group consisting of codecs and network switches associated with that location, and
- (b) each of the workstations has access to any of the resources.

- ¹⁰
211. The teleconferencing system of claim ¹207, further comprising a directory containing participant location information and wherein the compressed AV signals are routed using participant information in the directory.

- ¹¹
212. The teleconferencing system of claim ¹207, further comprising:
- (a) a participant locator that responds to a participant logging into a workstation by associating that participant with each such workstation logged into, thereby enabling the routing of a videoconference call, for that participant, to the workstation at which that participant is logged in.

- ²⁵
213. The teleconferencing system of claim ¹207, wherein video images are reproduced at a workstation as full-motion video.

- ²⁶
214. The teleconferencing system of claim ²⁵213, wherein the full-motion video images are reproduced at a workstation at a rate of at least about 30 frames per second.

⁴¹215. The method of conducting a teleconference of claim ²⁸218, further comprising the steps of:

- (a) associating a participant with each workstation logged into by the participant; and
- (b) routing a call to initiate a videoconference with such participant to the workstation at which that participant is logged in.

⁴²216. The method of claim ²⁸218, wherein video images are reproduced at a workstation as full-motion video.

⁴³217. The method of claim ⁴²216, wherein the full-motion video images are reproduced at a workstation at a rate of at least about 30 frames per second.

²⁸218. A method of conducting a teleconference among at least one participant at each of first and second locations, each location having at least one associated workstation with audio and video capture and reproduction capabilities and a codec and one of the locations having a Local Area Network switch, the method comprising the steps of:

- (a) linking the first and second locations with a third location including at least one workstation with audio and video reproduction capabilities and at least one codec;
- (b) capturing video images and spoken audio of a participant at the first location;
- (c) compressing signals representing the captured video and audio at the first location;
- (d) routing compressed signals, destined for the second location, to the third location;
- (e) receiving the routed signals at the third location and routing the received signals from the third to the second location without decompressing the received signals or reproducing the audio or video represented by the received signals at the workstation at the third location;
- (f) receiving the signals from the third location and reproducing the audio and video, captured at the first location, at the second location; and

5/5/97

(g) using the Local Area Network switch to route signals representing captured participant audio and video between the workstation and the codec at the location having the switch.

²⁷
219. The teleconferencing system of claim ²⁰62, further comprising a close-up selector for selecting the image of one of the participants in said mosaic image and replacing said mosaic image with the image of said selected image.

³⁸
220. The method of conducting a teleconference of claim ³⁴197 further comprising the steps of:

- (a) selecting the image of one of the participants in the mosaic image; and
- (b) replacing the mosaic image with the image of the selected image.

⁴⁰
221. The method of conducting a teleconference of claim ³⁹199, wherein the reproduced mosaic image includes images of the first, second and third participants, the method further comprising the step of:

- (a) reproducing the audio sum at the first participant's workstation such that the composition of the reproduced audio is dependent on a position of the images of participants in the reproduced mosaic image.